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## (54) Sliding trolley for sheet for lorry

(57) Described herein is a sliding trolley for horizontal displacement of the tarpaulin for a lorry, comprising:

- a bracket (2) having a rectilinear portion (3) and a "goose-neck" portion (4) to which the tarpaulin is fixed;
- a single-wheeled trolley (6), carried by the rectilinear portion (3) of the bracket (2), which slides in a first longitudinal groove (7) made in a horizontal beam (1) belonging to the supporting frame of the tarpaulin (5); and
- a sliding block (8) (or other equivalent means) fixed to the end of the "goose-neck" portion (4) and suitable to slide in a second longitudinal groove (9) made in the supporting beam (1) above the first groove (7).

The pin (14) of the single-wheeled trolley (6) slides in a vertical slot (10) made in the rectilinear portion (3) of the bracket (2), and a force is exerted on the pin (14) by an elastic element (15) which is fixed to or integral with the bracket (2).

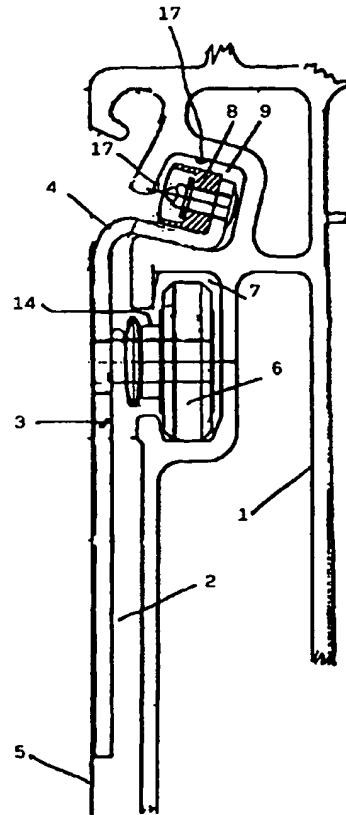


FIG. 1

**Description****Field of invention**

[0001] The invention consists of a sliding trolley for horizontal displacement of the tarpaulin for a lorry, the said trolley comprising:

- a bracket having a rectilinear portion and a "goose-neck" portion to which the sheet is fixed;
- a single-wheeled trolley, carried by the rectilinear portion of the bracket, which slides in a first longitudinal groove made in a horizontal beam belonging to the supporting frame of the sheet; and
- a sliding block (or other equivalent means) fixed to the end of the "goose-neck" portion and designed to slide in a second longitudinal groove made in the supporting beam above the first groove.

[0002] The pin of the single-wheeled trolley slides in a vertical slot made in the rectilinear portion of the bracket, and a force is exerted on the pin by an elastic element which is fixed to or integral with the bracket.

**Prior art**

[0003] Lorries of any size and carrying capacity, including semitrailers, are normally equipped with a covering (consisting of a plurality of tarpaulin supported by a frame fixed to the flatbed of the lorry) which protects the goods loaded on the lorry (above all) from bad weather conditions and which must be at least partially removed to enable the operations of loading and unloading of the lorry.

[0004] Many solutions are known for removing one of the tarpaulin that close the loading compartment of a lorry at the sides. The simplest solution consists in manually rolling up the tarpaulin and in fastening it by means of straps or equivalent means to the horizontal beam (belonging to the frame supporting the covering) from which the tarpaulin itself hangs.

[0005] The weight of the sheet and the overall dimensions of the tarpaulin when it is rolled up allow this solution to be adopted only for small-sized lorries.

[0006] To cover large-sized lorries and/or semitrailers for general use (i.e., ones not designed to transport particular types of goods that require specific equipment, such as a refrigerating cell), normally side tarpaulin are used which are supported by horizontal beams (belonging to the framework supporting the covering), from which they hang via means (normally trolleys made of plastic material) which slide in guides fixed to (or else integral with) the said supporting horizontal beam. The tarpaulin is therefore caused to slide horizontally along the said guides and is gathered up at one of the side uprights of the supporting frame.

[0007] Horizontally sliding sheets of the known type present a number of drawbacks, amongst which the fact

that, when they are in use, the sheet is normally anchored to the flatbed of the lorry and tightened to reduce resistance to motion during travel. The vertical stresses that derive therefrom are discharged (almost) totally on the trolleys, causing serious damage to the latter in a (relatively) short time.

[0008] Such vertical stresses are (or may be) particularly strong if the lorry is without side boards and the job of keeping the load in place is entrusted to the covering sheets.

[0009] In an attempt to overcome the above-mentioned drawback, trolleys are used which comprise pairs of wheels connected by a pin from which the tarpaulin hangs (either directly or else by means of a bracket or other equivalent means): the vertical forces exerted by the tarpaulin on the trolley are distributed between the wheels of each pair but in any case cause shearing stress on the connecting pin, which undergoes deformation (or may undergo deformation) and may possibly break, especially as a result of very violent stressings.

[0010] In addition, the horizontal supporting beam has (or carries) at least one guide in which the aforesaid trolleys comprising pairs of wheels slide, and consequently has a non-negligible width and protrudes inside the loading compartment, of which it limits the loading space.

[0011] The sliding trolley which forms the subject of the present invention enables the aforementioned drawbacks to be overcome since the vertical stresses are "discharged" totally on the supporting beam, without exerting stress on the trolleys, which may be of the single-wheeled type, so reducing the overall dimensions of the horizontal beam.

**Summary of invention**

[0012] The subject of the present invention is a sliding trolley for the tarpaulin of a lorry, comprising, combined together, the following items:

- a bracket comprising a rectilinear portion and a "goose-neck" portion to which the sheet is fixed;
- a single-wheeled trolley, carried by the rectilinear portion of the bracket, which slides in a first longitudinal groove made in a horizontal beam belonging to the supporting frame of the sheet; and
- means (preferably but not necessarily consisting of a sliding block) fixed to the end of the "goose-neck" portion and designed to slide in a second longitudinal groove made in the supporting beam above the first groove.

[0013] The pin of the single-wheeled trolley slides in a vertical slot made in the rectilinear portion of the bracket, and a force is exerted on the pin by an elastic element which is fixed to or integral with the bracket.

### List of figures

[0014] The invention will now be described in greater detail with reference to a non-limiting example of embodiment illustrated in the attached figures, in which:

- Figure 1 is a schematic representation of a side view of the top part of a supporting beam carrying a trolley according to the invention;
- Figures 2 and 3 present, respectively, a side cross-sectional view and a front view of a bracket belonging to the trolley of Figure 1;
- Figure 4 shows, in cross section, an enlarged side view of the rectilinear portion of the bracket, which has the vertical slot in which the pin of the single-wheeled trolley, on which a force is exerted by a spring fixed to the bracket, slides;
- Figure 5 is a front view of the spring illustrated in Figure 4; and
- Figure 6 is a schematic representation of a side view, a top view, and a cross section of a sliding block which constitutes the sliding means of the trolley of Figure 1.

[0015] In the attached figures, corresponding items are designated by the same numerical references.

### Detailed description

[0016] Figure 1 is a schematic representation of a side view of the top part of the horizontal supporting beam 1 carrying a trolley according to the invention, which comprises, combined together, the following items:

- a bracket 2, to which the tarpaulin 5 is fixed in a way in itself known; the bracket 2 comprises a rectilinear portion 3 and a "goose-neck" portion 4, which are more clearly visible in Figures 2 and 3;
- a single-wheeled trolley 6, which is carried by the rectilinear portion 3 of the bracket 2 and which slides in a first longitudinal groove 7 made in the supporting beam 1; and
- sliding means 8 (consisting, in the example of embodiment described herein, of a sliding block - Figure 6), which are fixed to the end of the "goose-neck" portion 4 of the bracket 2 and which slide in a second longitudinal groove 9 made in the supporting beam 1 above the first longitudinal groove 7.

[0017] The pin 14 of the single-wheeled trolley 6 slides in a vertical slot 10 made in the rectilinear portion 3 of the bracket 2, and a force is exerted on the pin 14 by the spring 15 which is fixed to or integral with the rectilinear portion 3 of the bracket 2 (Figures 4 and 5).

[0018] The solution of using a single-wheeled trolley enables a reduction in the overall dimensions of the horizontal beam 1 as compared to the overall dimen-

sions of the supporting beams used previously and designed to carry at least one trolley comprising a pair of wheels.

[0019] In the preferred embodiment described herein, on at least one internal wall of the second longitudinal groove 9, a longitudinal ribbing 17 is present, on which the sliding block 8 rests during the phases of opening and closing of the tarpaulin 5 (or anyway when the tarpaulin 5 is not in tension) to reduce the area of contact (and, consequently, of friction) between the sliding block 8 and the inner wall of the groove 9, and thus facilitate horizontal displacement of the tarpaulin 5.

[0020] Figures 2 and 3 present, respectively, a side cross-sectional view and a front view of the bracket 2 belonging to the trolley of Figure 1.

[0021] In the "goose-neck" portion 4 of the bracket 2, the through hole 13 is visible in which the fixing pin (which may be seen in Figure 1) of the sliding block 8 is inserted. In the rectilinear portion 3 of the bracket 2, the following may be seen: the vertical slot 10, in which the pin 14 of the single-wheeled trolley 6 slides (Figures 4 and 5), and a pair of grooves, 12 made along the side edges of the rectilinear portion 3, in which the ends 18 of the spring 15, which are bent in a Z-like fashion (Figures 4 and 5) engage.

[0022] The sheet 5 (not shown in Figures 2 and 3 for reasons of simplicity of graphical representation) is fastened to the bracket 2 by means of bolts inserted into the through holes 11 and of a possible fixing plate, not shown in the attached figures for reasons of simplicity of graphical representation.

[0023] Without departing from the scope of the invention, it is possible to replace the bolts inserted into the through holes 11 and the possible fixing plate, as well as the ends 18, bent back in Z-like fashion, of the spring 15, with other functionally equivalent hooking means, which are not described herein because they are known per se.

[0024] Figure 4 shows, in cross section, an enlarged side view of the rectilinear portion 3 of the bracket 2, which has the vertical slot 10 in which the pin 14 of the single-wheeled trolley 6, on which a force is exerted by a spring 15, slides, as may be better seen in Figure 5.

[0025] Figure 4 moreover shows the ends 18, bent back in a Z-like fashion, of the spring 15 and a spring washer 19 mounted on the pin 14 between the spring 15 and the wheel belonging to the trolley 6.

[0026] Without departing from the scope of the invention, it is, however, possible to omit the spring washer 19.

[0027] Figure 5 is a front view of the spring 15 illustrated in Figure 4. In Figure 5 the following may be seen: the body 16 of the spring 15 which has a "three-arched" shape, and the ends 18, bent back in Z-like fashion, of the spring 15, the pin 14 of the single-wheeled trolley 6 set under the central arch of the body 16 of the spring 15, and, in see-through view, the part of the rectilinear

portion 3 of the bracket 2 which has the slot 10 and the grooves 12.

[0028] As may be seen also in Figure 4, the means for hooking of the spring 15 to the rectilinear portion 3 of the bracket 2 consists of the ends 18, bent back in Z-like fashion, of the spring itself.

[0029] Figure 6 is a schematic representation of a side view, a top view, and a cross section of an embodiment of the sliding means 8 (belonging to the trolley of Figure 1), made up of a sliding block having the shape of a parallelepiped with square cross section, in the central portion of which are present a through hole and a groove that are suitable to receive the pin for fixing the sliding block 8 to the "goose-neck" portion 4 of the bracket 2, as well as the means for fixing the above-mentioned pin to the sliding block 8, which are not described explicitly herein because they are known per se and in any case extraneous to the present invention.

[0030] The operation of the sliding trolley which forms the subject of the present invention will now be described briefly with reference to the attached figures, and in particular Figures 1, 4 and 5.

[0031] Figure 1 shows the configuration of the aforementioned trolley when the tarpaulin 5, tightened, pulls the bracket 2 downwards (Figure 4, arrow 20). The pin 14 of the single-wheeled trolley 6 slides in the vertical slot 10 of the bracket 2, so moving upwards with respect to the bracket 2 (Figure 4, arrow 21) and "loading" the spring 15, whilst the bottom part of the "goose-neck" portion 4 of the bracket 2 comes into contact with the lower edge of the second groove 9 of the supporting beam 1, as illustrated in Figure 1.

[0032] The vertical stresses are therefore supported exclusively by the supporting beam 1 (suitably sized so as to withstand such stresses), whilst the single-wheeled trolley 6 is (almost) completely "unloaded", in that it is subjected only to the elastic reaction of the spring 15, and (unlike hitherto known trolleys) does not run any risk of being damaged by the vertical stresses transmitted by the sheet 5 to the bracket 2.

[0033] For proper operation of a trolley according to the invention, the vertical slot 10 must be located in the rectilinear portion 3 of the bracket 2 so as to be in a point corresponding to the pin 14, and its length must be such as to enable the pin 14 to perform a travel not shorter than the distance between the bottom surface of the "goose-neck" portion 4 of the bracket 2 and the bottom edge of the second groove 9 of the supporting beam 1 when the tarpaulin 5 is not tensioned.

[0034] When, instead, the tarpaulin 5 is not tensioned (for example, because it is not anchored to the flatbed of the lorry), the elastic reaction of the spring 15 exerts a force on the bracket 2 to force it to move upwards with respect to the pin 14 of the single-wheeled trolley 6, which slides freely in the vertical slot 10 of the bracket 2 to assume the position schematically indicated in Figure 5. The displacement upwards of the bracket 2 causes the "goose-neck" portion 4 of the

5 bracket 2 to move away from the bottom edge of the second groove 9 of the supporting beam 1, so enabling an easy horizontal displacement of the tarpaulin 5 carried by the single-wheeled trolley 6, which slides in the first longitudinal groove 7 of the supporting beam 1.

[0035] The sliding block 8 prevents the "goose-neck" portion 4 of the bracket 2 from accidentally coming out of the groove 9 when the tarpaulin 5 is not tightened. In order to prevent, during horizontal displacement of the tarpaulin 5, the sliding block 8 from scraping accidentally against the inside walls of the groove 9, in the preferred embodiment described herein the sliding block 8 rests on the longitudinal ribbing 17 present on at least one internal wall of the second longitudinal groove 9.

[0036] Without departing from the sphere of protection of the present invention, it is possible for a person skilled in the art to make to the sliding trolley for the sheet of a lorry, which forms the subject of the present description, all those modifications and improvements suggested by normal experience and by the natural evolution of technology.

## Claims

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1. A sliding trolley for a tarpaulin for a lorry, characterized in that it comprises, combined together, the following items:

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- a bracket (2), to which the tarpaulin (5) is fixed, the bracket (2) comprising a rectilinear portion (3) and a "goose-neck" portion (4);
- a single-wheeled trolley (6), which is carried by the rectilinear portion (3) of the bracket (2) and which slides in a first longitudinal groove (7) made in a horizontal beam (1) belonging to the supporting frame of the tarpaulin (5); and
- sliding means (8), which are fixed to the end of the "goose-neck" portion (4) of the bracket (2) and which are suitable to slide in a second longitudinal groove (9) made in the supporting beam (1) above the first longitudinal groove (7);

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and in that the pin (14) of the single-wheeled trolley (6) slides in a vertical slot (10) made in the rectilinear portion (3) of the bracket (2), and a force is exerted on the pin (14) by an elastic element (15) which is fixed to or integral with the bracket (2).

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2. Sliding trolley according to Claim 1, characterized in that the vertical slot (10), located on the rectilinear portion (3) of the bracket (2) in a point corresponding to the pin (14), is suitable to allow the pin (14) to perform a travel not shorter than the distance between the bottom surface of the "goose-neck" portion (4) of the bracket (2) and the bottom edge of the second groove (9) of the supporting beam (1) when the tarpaulin (5) is not tightened.

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3. Sliding trolley according to Claim 1, characterized in that the sliding means (8) are represented by a sliding block.
4. Sliding trolley according to Claim 1, characterized in that the rectilinear portion (3) of the bracket (2) comprises a pair of grooves (12) made along its side edges, which are suitable to receive the hooking means of the elastic element (15). 5
5. Sliding trolley according to Claim 1, characterized in that the elastic element (15) consists of a spring comprising a body (16) which has a "three-arched" shape and has its ends (18) bent back in Z-like fashion, the central arch of the body (16) of the spring (15) being in contact with the top part of the pin (14) of the single-wheeled trolley (6). 10 15
6. Sliding trolley according to Claims 4 and 5, characterized in that the means for hooking the spring (15) to the bracket (2) consist of the ends (18) bent back in Z-like fashion, of the spring itself. 20
7. Sliding trolley according to Claim 1, characterized in that the "goose-neck" portion (4) of the bracket (2) has a through hole (13) suitable to receive the fixing pin of the sliding means (8). 25
8. Sliding trolley according to Claim 1, characterized in that present on at least one internal wall of the second longitudinal groove (9) is a longitudinal ribbing (17) on which the sliding means (8) rest when the tarpaulin (5) is not tightened. 30

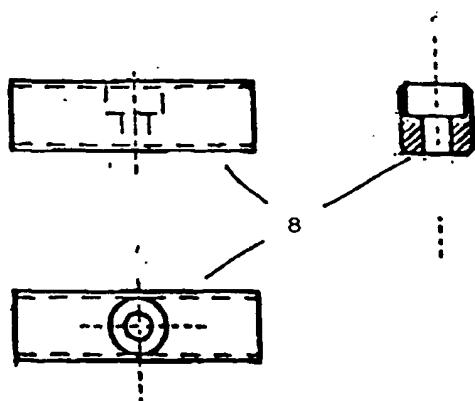
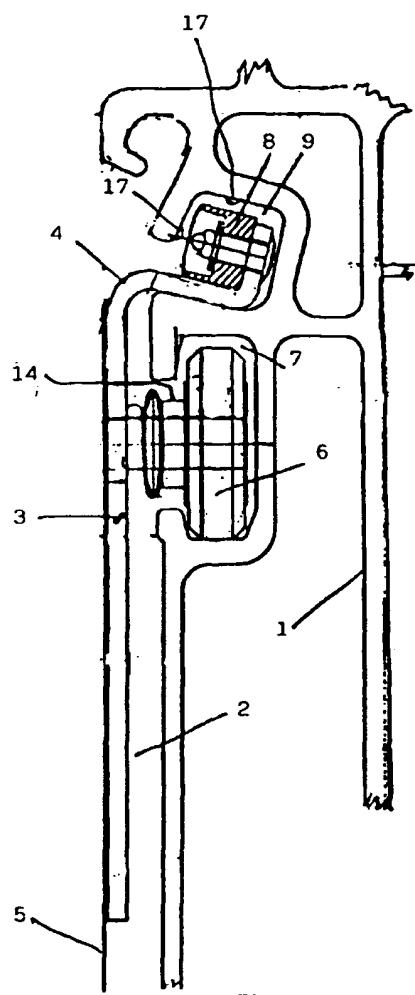
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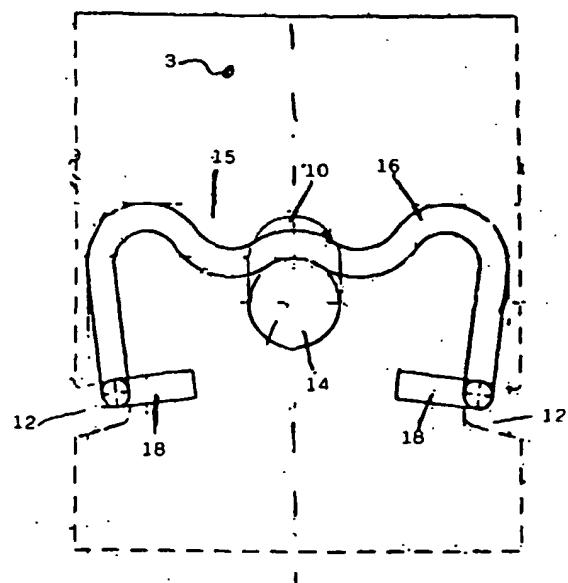
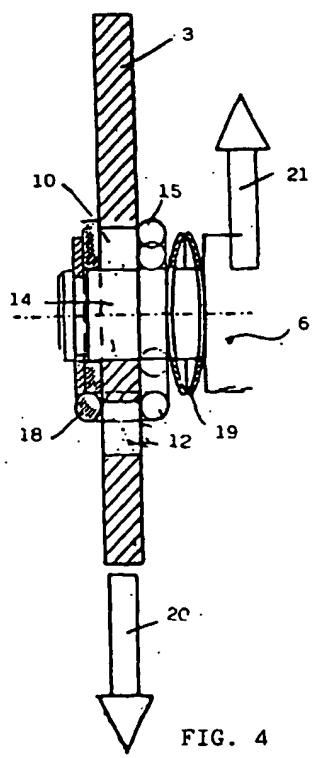
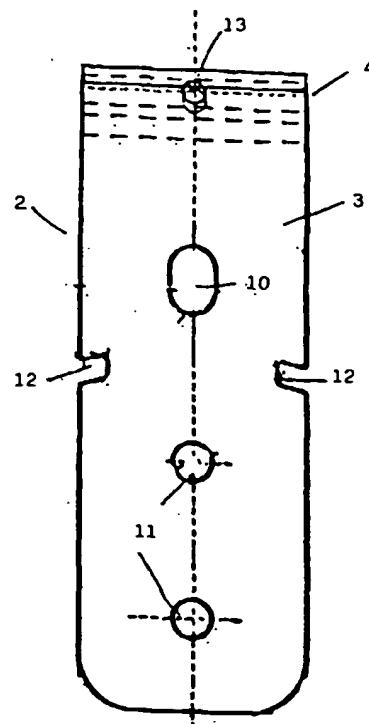
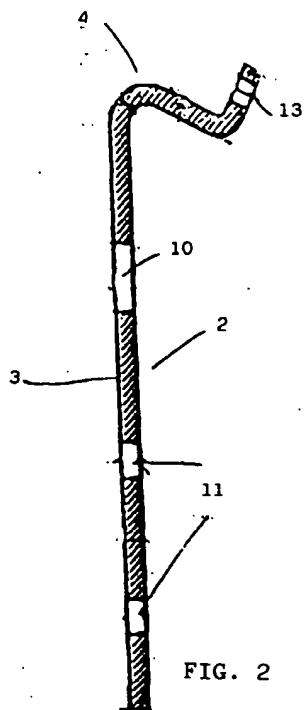
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## EUROPEAN SEARCH REPORT

Application Number

EP 00 10 3050

DOCUMENTS CONSIDERED TO BE RELEVANT													
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.)										
A	EP 0 153 030 A (BOALLOY LTD) 28 August 1985 (1985-08-28) * figure 3.4 *	1,3	B60J7/10										
A	DE 298 20 721 U (EADIE IND LTD) 21 January 1999 (1999-01-21) * figures 1,2,4 *	1,3											
A	DE 87 09 691 U (SCHMITZ-ANHÄNGER FAHRZEUGBAU GESELLSCHAFT MBH & CO) 26 November 1987 (1987-11-26) * figure 2 *	1											
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TECHNICAL FIELDS SEARCHED (Int.Cl.)													
B60J B62D													
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>BERLIN</td> <td>7 June 2000</td> <td>Thomas, C</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	BERLIN	7 June 2000	Thomas, C				
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<p>CATEGORY OF CITED DOCUMENTS</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">X : particularly relevant if taken alone</td> <td style="width: 33%;">T : theory or principle underlying the invention</td> </tr> <tr> <td>Y : particularly relevant if combined with another document of the same category</td> <td>E : earlier patent document, but published on, or after the filing date</td> </tr> <tr> <td>A : technological background</td> <td>D : document cited in the application</td> </tr> <tr> <td>O : non-written disclosure</td> <td>L : document cited for other reasons</td> </tr> <tr> <td>P : intermediate document</td> <td>&amp; : member of the same patent family, corresponding document</td> </tr> </table>				X : particularly relevant if taken alone	T : theory or principle underlying the invention	Y : particularly relevant if combined with another document of the same category	E : earlier patent document, but published on, or after the filing date	A : technological background	D : document cited in the application	O : non-written disclosure	L : document cited for other reasons	P : intermediate document	& : member of the same patent family, corresponding document
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 00 10 3050

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The members are as contained in the European Patent Office EDP file on  
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07-06-2000

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